Minutes of the Rhode Island Atomic Energy Commission

Meeting of 8 October 2010

8:30 A.M.

Preliminary Version- Pending Commission Approval

Dr. Mecca called the meeting of the Rhode Island Atomic Energy Commission to order. Present were Commissioners Dr. Nassersharif, Dr Nunes, Dr Gromet and Dr.Mecca, and staff: Dr. Terry Tehan, Jeff Davis, Zack Richards and Steve Guarino. Dr. Kadak was excused.

Minutes of the 14 May 2010RIAEC Meeting.

Dr. Nunes made a motion to accept the minutes. Dr. Nassersharif seconded the motion. The minutes of the meeting were reviewed. A Motion to accept the minutes passed unanimously. (Enclosure 1)

1. NRC Re-licensing – (Enclosure2) A discussion was held regarding the status of the license renewal efforts. Dr. Mecca thanked Jeff Davis for coordinating the RAI response effort. When asked whether or not a schedule was in place for completion of the remaining questions, the commission learned it was not and asked Jeff Davis to annotate his spreadsheet with expected completion dates. His expected completion date (end of the year) was challenged as to feasibility and he was encouraged to revise accordingly to a realistic schedule.

2. Budget- (Enclosure 3) A discussion was held regarding the

FY2010/2011 state budget. The Director pointed out that payroll had been encumbered for the rest of the year and the remaining operating budget would likely be used up by the third quarter based on historical spending patterns. The FY 2011-2012 budget submission did not contain the requested 5%, 10% and 15% cuts because they would jeopardize NRC license renewal financial assurance requirements. While the commission intends to cut insurance and LLW Forum Membership, there is a chance that the commission may need to justify the proposed budget to the Governor to prevent further cuts.

3. Web site/ Fuel Shipment - (Enclosures 4 and 5) Steve Guarino discussed the recent fuel shipment. The initial shipment went well and procedures are being updated to reflect lessons learned. The next shipment is scheduled for early December. In regard to website development, he stated that the state will host the website and we are working on modifying our software to meet state requirements.

4.Facility Utilization – (Enclosures 7 and 8) A discussion was held regarding facility utilization . Zack Richards presented a plan for updating the center's information technology systems. Dr. Mecca pointed out that a top down approach should be utilized from the start of the project. Dr. Tehan stated that the funding from the project may be available from NNSA and that they are scheduled to do an audit of the facility in April. Dr. Mecca thanked the staff for their written reports and, with the concurrence of members present made

three suggestions to the newer staff: 1. Try to get these to the Commission at least a couple of working days prior to the meeting as opposed to the evening before the meeting; 2. Summarize the significant points; 3. We have numeric indices of utilization for the reactor – let's try to identify some quantitative measures for the utilization of other resources including staff.

5. Dr. Nassershrif brought up the question of the RIAECs duties and responsibilities under state law and our relationships with other state agencies. After a discussion of the issue, it was decided that a review of state statutes should be conducted and the full matter of the RIAEC's responsibilities be considered at the next meeting. . Dr. Nassershrif made a motion to review the state laws for responsibilities of the RIAEC at the next Commission meeting. Dr. Gromet seconded the motion. The motion passed unanimously.

6.Dr. Mecca stated that the next commission meeting should be held the last part of January or early February 2011. Dr. Tehan stated that a doodle schedule would be posted and requested that commission members fill it out as soon as possible so that a meeting date could be finalized.

7. Dr. Nunes made a motion to adjourn. Dr. Nassershrif seconded the

motion. The motion passed unanimously

Enclosure 1: Minutes of the Rhode Island Atomic Energy Commission Meeting of 14 May 2010

Dr. Mecca called the meeting of the Rhode Island Atomic Energy Commission to order. Present were Commissioners Dr. Nassersharif, Dr. Kadak, Dr Nunes and Dr.Mecca, and staff: Dr. Terry Tehan and Jeff Davis. Bill Golas of the Budget office. Dr. Gromet was excused.

1.Minutes of the 29 December 2009 RIAEC Meeting.

Dr. Kadak made a motion to accept the minutes. Dr. Nunes seconded the motion. The minutes of the meeting were reviewed. A Motion to accept the minutes passed unanimously. (Enclosure 1)

2. License Renewal An extensive discussion was held on the status of the license renewal of the reactor. NRC's questions on the renewal license application were extensive as if it was a complete new license and not focusing on age related issues typically addressed in power reactor license renewals. The Commission sent a letter to the NRC asking for a meeting and clarification of the basis for renewals of research reactors. The call by Dr. Mecca to Chairman Jaycsko was not returned. A review of the status of the hundreds of questions was

made. It was decided that the staff would answer those questions that are readily answerable and include the results of the safety reanalysis being performed by Argonne National Laboratory. It was also suggested that the staff include the original 1962 safety analysis report in our response as well as a reminder of the 1994 safety analysis reviewed by NRC as part of the low enriched fuel upgrade which contains the latest safety analysis. No commitments should be made by RISNC staff as to completion of the answers until we are able to meet with the NRC commissioners to clarify the renewal process. It appears that the 60 day response schedule demanded by NRC is driven by the poor performance of NRC in reviewing license renewals since the RINSC application was filed more that 6 years ago.

The staff was also directed to contact other research reactors to determine the status of their license renewal efforts and NRC interactions. Should they be similar, it was suggested that those reactors develop a common position on NRC's process as being unduly burdensome compared to that of power reactors that have much larger radioactive inventories and energy content.

The Commission expects to be fully informed of the interactions with NRC and the status of the answers to the questions. The Commission needs to review the letter containing whatever responses are prepared. Under the circumstance that RINSC does not have the financial nor technical resources to respond to each question and the disruption in normal activity precipitated by this

RAI, it is desirable to formally document the RIAEC plan to the NRC in the near term asking for an extension with no date specified pending a meeting with the NRC Commissioners.. Pending special funding for such a meeting, encouragement for travel to Washington for such a meeting was noted by those present.

3. Budget. Dr. Tehan presented his report on the budget (enclosure 2).

4.Staffing-The health physicist position was discussed.

5. Old Business- The next meeting of the Commission will be in July

6..Dr. Nassershriff made a report on the Nuclear Engineering program at URI and the new grants.

7. Dr. Nunes made a motion to adjourn. Dr. Nassershrif seconded the motion. The motion passed unanimously

Enclosure 2: RAI Memo

RAI Status Report

The original facility R-95 License expired at midnight on August 27, 2002. NRC granted a license extension until midnight on November 28, 2004. This extension was granted in order to account for facility construction time. RINSC submitted an application for re-licensing on

May 3, 2004, and has been in timely renewal since.

In February 2010, NRC informed the staff of the facility that it was reviewing the RINSC re-licensing application. In April 2010, NRC sent a letter requesting additional information regarding the application. This letter included 252 technical questions. The staff has been working steadily in conjunction with representatives from Argonne National Laboratory to do a new safety analysis for the core, and to answer the questions submitted by NRC. The RINSC response has been broken into a series of responses. To date, RINSC has sent the following responses back to NRC:

10 June 2010 47 Questions Answered

6 August 2010 45 Questions Answered

18 August 2010 4 Questions Answered

8 September 2010 45 Questions Answered

At present, a total of 141 questions have been answered, and 111 questions remain to be answered. Though NRC originally set a 60 day deadline for answering these questions, they are no longer setting a strict deadline as a result of action taken by the RIAEC

Science Center

Enclosure 3-Budget

To all:

General Account(2910101)

2011 Enacted $875,781 spent 191,303 encumbered 644,871

funds available $39,607

comment: the state has already encumbered salaries for the rest of the fiscal year. If we did not have sponsored research funds we would be in real trouble.

URI Sponsored Research (2895101)
2011 enacted $266,4110 spent -38,149 encumbered 159,653 funds available $144,906

Gadolinium Research (2915103)

2011 enacted 43,159 spent 32,233 encumbered 2,488 funds available $13,361

Nuclear Energy Education (2915105)
2011 enacted 10,000 spent -20,993 encumbered 0 funds available 20,993

Nuclear Energy University Infrastructure (2915106)

2011 Enacted 247,000 spent 126,599 encumbered 33,784 funds available $86,432

note: we had to go for a no cost grant extension from DOE because we are behind on doing the digital upgrades that are requested in the grant. Bruce, Zack and Jeff have been working on RAIs and this work

was lower priority.

The big budget issue is the 2011 revised budget/ 2012 submission that went in on Oct. 1. We did not give the Governor the 5%, 10% and 15% cuts he wanted. depending on how much heat we get, the commission may have to meet with the Governor.
-Terry

Enclosure 4- fuel shipment
MEMO
RIAEC
16 Reactor Road
5 October 2010
To: RIAEC Commissioners
From: Stephen Guarino
Subject: RINSC Fuel Arrival
On Tuesday 28 September four new RINSC fuel elements arrived at the reac-
tor. The elements were unpacked and inspected before being transfered to the fuel

safe. Each fuel element and cask was surveyed by the health physics department for
contamination. Each element was also measured to make sure they _t the design
criteria. No contamination was found on any element or any cask. No element failed
measurement inspection.
On Monday 4 October the empty casks were shipped back to Babcock & Wilcox
via FedEx Custom Critical.
Currently Je_ Davis and I are working to update our procedure for handling fuel
to create a more streamlined approach. Je_ is focusing on the operations end (quality
assurance, transfer to the safe or core etc.). I have focused on building a step by step
guide to receiving the fuel shipment, shipping the empty casks and surveying all
appropriate apparatus for radioactive contamination.
1

Enclosure 5- website

MEMO
RIAEC
16 Reactor Road

5 October 2010

To: RIAEC Commissioners

From: Stephen Guarino

Subject: RINSC Website

The RINSC commissioned an outside webpage designer to build the RIAEC and

RINSC a webpage to be posted on the GSO server. The page has been built and was

temporarily posted under the url, www.gso.uri.edu/rinsc. Since then the webpage

has been taken down and di_erent options for url's have been researched by myself

and Dr. Nassersharif. The following is an outline of the costs associated with each

url.

WWW.RINSC.COM

URL = $ 3000

Server = $ 50 yr host $ 50 hr modify

The website would still exist on the GSO server but it would appear to be a stand

alone website to someone sur_ng the internet. We would maintain the content and

the GSO would maintain the security.

WWW.RINSC.ORG

URL = $ 15 yr

Server = $ 50 yr host $ 50 hr modify

The website would still exist on the GSO server but it would appear to be a stand
alone website to someone sur_ng the internet. We would maintain the content and
the GSO would maintain the security.
WWW.RINSC.RI.GOV
URL = $0 Through State of RI
Server = Unknown Through State of RI

Enclose 6 Facility Utilization

To: RIAEC
From: Zachary Richards, Reactor Supervisor, RINSC
Re: 2010 Facility Usage and Operations
Date: 10-6-10
Gentleman,
Since January 1st the reactor has logged an additional 562 Megawatt-hours of operation. These hours represent our continuing role in research and education. We continue to serve private industry, primary and secondary educational institutes, and the interested public throughout New England. This work includes past facility users as well as other groups that have been added over the year. In addition to the work done inside, the facility has made great steps forward in our exterior image, public perception, and community involvement.
Our primary researcher from the private industry continues to be

BioPAL Inc. of Worcester, Massachusetts. Their research at the RINSC focuses on sample tracking and analysis for biomedical and pharmaceutical research. The Infoscitex Corporation is another private research company utilizing the RINSC reactor. Their area of study at the RINSC concentrates on material research for aerospace and satellite production. Between these two groups, approximately 1330 sample-hours have been logged on the Pneumatic In-Core Irradiation Facility (the "Rabbit System"), with an additional 528 sample-hours for the In-Core Radiation Baskets. Through these partnerships the RINSC has brought in monetary funds as well as obtained new instrumentation. The staff continues to seek out additional researchers interested in the facility. Currently, discussions are being held with multiple parties on the terms, requirements, and restrictions of new research at the RINSC facility.

The Nuclear Science Center's role in education has grown through the year. In June the US NRC awarded Reactor Operator and Senior Reactor Operator Licenses to members of the RINSC staff. A SRO test is scheduled for December. The continuing education of the RINSC staff represents a greater ability to serve outside groups. During the spring semester there were a number of educational groups and students that came to the facility for tours and labs. For post secondary institutions this list included groups from URI, PC, Roger Williams, and Three Rivers Community College. The groups performed a variety of labs from neutron activation analysis and half-life determination, to reactor start-ups and control rod worth inspections. Also, several different undergraduate students have held

internship positions at the facility. This allowed them a unique, in-depth look at the day-to-day operations, maintenance, and research that takes place at a nuclear facility. The addition of Nuclear Engineering courses at URI has caused an increase in student activity through tours, labs, and research projects. Last year's Mechanical Engineering Senior Design group has been selected as a finalist for a design competition hosted by the American Nuclear Society. They are currently preparing for a trip to Las Vegas, Nevada to compete for first place. This year's group has begun work on controlling the level of Ar-41 emissions for a 5 MW power upgrade. Also, two students from the URI Physics Department were awarded their degrees following projects performed at the RINSC using neutron scattering. Another physics senior project has recently begun that will use neutron activation for the determination of flux characteristics in irradiation facilities.

Enclose 7-Operations report

RINSC Operations Report

At the 12 December 2009 RIAEC meeting, the Commissioners provided a number of initiatives and goals for the RINSC staff to work toward. This list of initiatives included:

Facility Clean-Up

Education Outreach

Funding Support for a Summer Science Teacher Workshop

University Faculty Luncheon

Develop a Digital Floor Plan

IT Upgrade

Since that meeting, the RINSC staff has been working on these initiatives, as well as other important facility projects.

Facility Clean-Up

Since the beginning of the year, the RINSC staff has been working on cleaning up the facility. Two rooms in the basement area that had been junk storage rooms have been cleaned out. One has been re-painted and will eventually be used for the Health Physicist's office. The other has been converted into a RAM waste processing laboratory. The facility has been in need of a dedicated laboratory for processing RAM waste. Until recently, waste has been getting processed in the basement hallway. This hallway area has also been cleaned up. All of the RAM waste that was in the hallway has been characterized, and is ready for disposal.

The two basement laboratories that are currently in use by Dr. John Leith were also cleaned up. The staff requested that Dr. Leith come to the facility and straighten up his lab space, and he did so.

The confinement room has been cleaned up. The staff contacted the URI Physics department to determine what items in confinement were still of value, prior to throwing things out. We are in the process of collecting all of the old electronic equipment so that we can determine whether or not any of it is worth keeping. Anything deemed to be junk will be taken off of the state inventory list, scavenged for parts, and scrapped.

Over the summer, the staff has been working on cleaning up the

outside of the facility, particularly in the cooling tower area, and in the lower parking lot area. At some point in the future we intend to coordinate with the GSO campus to do some landscaping to try to improve the view around the facility. There has been discussions about making these improvements as part of a senior landscaping design class at URI.

At present, we are working on cleaning up the basement area under confinement. Historically, this area has been used to store old samples and RAM waste. Our goal is to clean out one of the bunker rooms to make it into a RAM waste storage area, and in the process, clean out the basement area under confinement.

In piecemeal fashion, the staff has been going through old paperwork, archiving the historically significant documents, and throwing out the stuff that is no longer relevant. As part of this, we have been putting together a narrative of the facility history based on the documents that we are uncovering.

Control Room Painting Project

The staff has been working on cleaning up the control room and making it presentable for classes that are using the reactor for laboratory exercises. As part of this, the control room is in the process of being re-painted.

Facility Outreach

RI Department of Education

The RINSC staff developed an education brochure that briefly describes our research efforts, and shows off the classroom and laboratory facilities. In April 2010 RINSC made contact with Peter

McLauren from the RI Department of Education. He specializes in Science and Technology. He distributed the brochure at the RI Science Teachers Conference.

GSO Teacher Workshop

In April 2010 RINSC participated in a Teacher Workshop that is put on annually by the Graduate School of Oceanography. As we always do, we distributed our education pamphlet and encouraged the teachers to bring their classes for tours, laboratories, and science fair projects.

Science Fair

In March 2010, RIAEC made a presence at the annual RI State Science Fair. Prizes were awarded on behalf of RIAEC to the Junior and Senior projects that were deemed to be the best energy related projects. In both cases, the prize was Nuclear Energy: An Introduction to the Concepts, Systems, and Applications of Nuclear Processes, 6th ed. By Raymond Murray. Prizes were awarded to:

Junior Prize:

Sean Breslin from Curtis Corner Middle School

His project was entitled "Optimal Spacing of Magnets in a Gauss Magnet Accelerometer". He used a series of magnets to accelerate steel balls down a track and measured the average acceleration.

Senior Prize

Vincenzo Moretti from Prout

His project was entitled "Pulsed Linear Induction Motor". He designed and built an electric circuit that charged a capacitor that could be discharged through a transformer to generate a magnetic

field through a coil, which was used to propel a projectile.

Meeting with the Associate Dean of GSO

In January 2010 the Assistant Director for Operations met with the Associate Dean of the Graduate School of Oceanography. He informed the Dean of the Commission's desire to have a faculty get together at RINSC to discuss how RINSC could play a larger role in the research taking place on the campus, and to coordinate RINSC grant purchases to ensure that we are obtaining equipment and infrastructure that will be useful to a wide variety of researchers on campus. They also discussed emergency and security issues. The Associate Dean suggested that RINSC give a presentation to the GSO faculty at one of their faculty meetings.

GSO Faculty Meeting Presentation

In February 2010, the Assistant Director for Operations gave a presentation to the GSO faculty at one of their meetings. The presentation briefly went over the history of the facility, it's mission, and it's current capabilities. The Assistant Director expressed the RINSC's interesting cooperating with them to re-build the facility in a way that provides them with useful infrastructure for doing their research.

RINSC K-12 Teacher Workshop

RINSC attempted to make contact with the RI Chapter of the NEA to request that they put a brief article about the facility in their newsletter with an invitation to participate in a workshop to acquaint RI science teachers with nuclear science. Unfortunately nobody from the NEA responded.

Saturday Science Outreach

RINSC participated in a GSO Campus science outreach event that took place on a Saturday in June. This event was put together by an Oceanography graduate student. She invited local residents from the community to campus to get a first hand look at the science and research work that is going on at the Bay Campus. More than 100 people from the community toured the facility. The staff gave an overview of how the reactor works, how the safety system works, and what the reactor can be used for. As always, everyone was fascinated by the blue glow.

Teacher Contact List

RINSC is attempting to develop a database with contact information for middle school and high school science teachers in order to make our outreach efforts more effective. The staff attempted to go through the teachers union, but they won't release their member list.

Student Intern Program

The staff has been developing a more formalized program for student interns. The goal is to have a pathway for a limited number of science / engineering students to participate in the maintenance and operation of the reactor, and to have an opportunity to work on special engineering projects at the facility. Ideally, interns would be eligible to take a Reactor Operator License exam at the end of a year of service. Our current interns are:

Taylor Lichatz (URI Chemical Engineering)

Taylor worked on developing a RINSC Laboratory Manual. The staff is in the process of using it as a starting point for having a general

laboratory manual that has a wide variety of laboratory exercises that classes could use in conjunction with their lectures.

Taylor also helped get many facility documents and pictures into digital pdf format.

Taylor graduated in May 2010, and was hired by the NRC in August 2010.

Mike Audette (URI Mechanical Engineering)

Mike is currently finishing the Rabbit System Upgrade Project. The final design changes have been completed, and almost all of the components have been received. The piping mach-up has been started, and the permanent installation is expected to begin very soon.

This project was entered in a student design competition associated with the American Nuclear Society. It was selected as on of the two national finalists. The design team will be presenting their project at the national ANS meeting later this year.

Ben Simon (URI Electrical Engineering)

Ben is working on designing and building a control system for the new rabbit system. For the initial phase of the project, the objective is to re-create a simple system that mimics what the current system does. In the future, the control system may be enhanced with additional rabbit tracking features, control room indications, etc.

Ben is also working on designing and building a new reactor pool make-up system. The current system is very difficult to test. The objective of this project is to make a simple system that is easily accessible, and easily testable.

Gafar Odufuye (URI Mechanical Engineering)

The staff is working on determining a project for Gafar.

Funding Support for a Summer Science Teacher Workshop

Dr. Nunes and the RINSC staff started looking into what the appropriate format and content would be for a teacher workshop. Funding for a summer science teacher workshop remains to be found.

University Faculty Luncheon

The RINSC staff spoke to Dr. Nancy Breen at Roger Williams University about the desire to have a strategic planning workshop with university researchers to help RINSC determine what kinds of equipment that we should try to acquire as part of our grant purchases. This was also discussed with the URI GSO faculty during one of their faculty meetings. Funding still needs to be found.

Digital Facility Floor Plan

As part of RIAEC's strategic planning meeting in December 2009, the Commissioners requested that the RINSC staff develop a digital facility floor plan. RINSC acquired a beta version of Microsoft Visio, and developed a scale facility floor plan. Armed with this floor plan to use as a template, the staff has developed floor plans that show a variety of information:

Facility Map of Hazards and Fire Alarm Sensor Locations

Facility Map of Security Alarm Sensor Locations

Additionally, the RINSC staff has been using Visio to develop simple drawings of various engineering systems, such as:

RINSC Normal and Emergency Ventilation System

RINSC Primary and Secondary Cooling Systems Loops #1 and #2

IT System Upgrade

The staff has been working on getting a facility website running. Tremendous thought has been put into who should host the website, who will maintain the website, how website security will be handled, etc. In addition to using the website as a marketing tool, our intention is to be able to use it as a portal for remote access to research equipment instrumentation and control. A preliminary site was set up, but discussions about who should host the site, and what content should be on the site are ongoing. Mr. Steve Guarino has prepared a brief memo describing the current options being considered.

The RINSC staff has been putting some thought into getting the IT network organized. At present, the main switch is mounted in an inconvenient location, and has a rats nest of wires surrounding it. Several years ago, the GSO IT department built an IT room in the confinement basement area. The staff has determined that in order to upgrade the system, and move it to this room will cost between $15,000 to $18,000. In the future, the staff is hoping to add climate control to the IT room, and to move this system as well as the security camera server to the room.

The staff has been looking into getting a document database. They have been in the process of making digital files of historical documents, facility engineering documents, etc., and are looking into the possibility of having a database that would make it easy to find documents and information. It is our understanding that the URI Physics department developed one of these databases, and there is

some possibility that RINSC may be able to obtain a copy of this database program.

Re-Licensing

The original facility R-95 License expired at midnight on August 27, 2002. NRC granted a license extension until midnight on November 28, 2004. This extension was granted in order to account for facility construction time. RINSC submitted an application for re-licensing on May 3, 2004, and has been in timely renewal since.

In February 2010, NRC informed the staff of the facility that it was reviewing the RINSC re-licensing application. In April 2010, NRC sent a letter requesting additional information regarding the application. This letter included 252 technical questions. The staff has been working steadily in conjunction with representatives from Argonne National Laboratory to do a new safety analysis for the core, and to answer the questions submitted by NRC. The RINSC response has been broken into a series of responses. To date, RINSC has sent the following responses back to NRC:

10 June 2010 47 Questions Answered

6 August 2010 45 Questions Answered

18 August 2010 4 Questions Answered

8 September 2010 45 Questions Answered

At present, a total of 141 questions have been answered, and 111 questions remain to be answered. Though NRC originally set a 60 day deadline for answering these questions, they are no longer setting a strict deadline as a result of action taken by the RIAEC Commissioners.

Fuel Fabrication and Receipt

In 1993, RINSC converted from HEU fuel to LEU fuel. The fuel received in 1993 included fuel element numbers RI-001 through RI-018. The first 14 elements were loaded into the core and used for operation until October 2008. There were three core configurations that utilized elements RI-001 through RI-014. Each core change involved increasing the efficiency of core neutron reflection to offset fuel burn-up. In October 2008, four burned elements were replaced by the fresh fuel in storage: element numbers RI-015 through RI-018. At that point, RINSC started operating with it's equilibrium core configuration. All future core changes will involve replacing four burned fuel elements with fresh elements.

In October 2008, the RINSC staff contacted DOE and requested that new replacement fuel be fabricated for use by the RINSC Reactor. It had been 17 years since RINSC last received fuel. In that time, there have been many changes made in the way that fresh fuel is shipped. A new type of shipping container has been developed and certified. A custom designed fuel basket had to be designed, approved, and fabricated in order to use this shipping container for RINSC fuel. The RINSC staff had to develop new procedures for handling these containers, verifying and accepting the fuel, and performing receipt and shipping radiological surveys. Eight fuel elements and two dummy elements were fabricated for RINSC. The first four elements were received on 28 September 2010. The

shipping casks were returned on 4 October 2010. The staff anticipates that the remaining fuel will be received in late October or Early

November.

In June of 2010, NMMSS requested that licensees provide them with an estimate of anticipated fuel shipments for the next five years. RINSC shared this information with DOE in order to help them forecast the facility's future fuel fabrication needs. It is estimated that at the present operating schedule, RINSC will need to perform a re-fueling operation approximately every two years.

NRC Inspections

NRC performed a routine inspection of the facility in March 2010. This inspection covered:

Operations

Maintenance Activities

NRSC Review and Audit Activities

Facility Changes

Experiments

Procedures

Radiation Protection

Effluent and Environmental Monitoring

Radioactive Material Transportation

Security

Special Nuclear Material Control and Accountability

No violations were found. An inspector follow-up item regarding the integration of reactor power level was closed. No new items were opened.

NRC performed another routine inspection of the facility in September 2010. This inspection covered:

Organization and Staffing

Safety Conscious Work Place

Technical Specification Surveillances

Fuel Movements

Operator Re-Qualification Program

Emergency Program

Though an official inspection report has not been received, during the NRC outbrief the inspector indicated that there were no violations or inspector follow-up items.

On 9 September 2010, representatives from NRC's upper management visited RINSC. During their visit, the re-licensing project was discussed

Emergency Program

In February 2010 RINSC participated with the US Army in a training exercise involving theft of a Co-60 source, evidence of bomb making, and information about the Ryan Center.

Representatives from Local Emergency Planning Committee #4 requested that RINSC send representatives to join the committee. This committee includes representatives from industry, University of Rhode Island, local fire departments, and local and state political offices for the purpose of developing a coherent emergency plan for southern RI. RINSC joined the committee and participated in meetings that occurred in February and June of 2010. The next meeting will be held on December 14th at RINSC.

The annual emergency drill was held on 7 September 2010. The emergency involved a fire inside confinement that was too large for

the RINSC staff to handle without outside agency assistance. The drill included an unannounced evacuation of the facility. The facility NRC inspector was present to observe.

On 8 September 2010, RINSC hosted the Narragansett Fire Department, as well as the Chair of the Local Emergency Planning Committee #4, and representatives from Union and Kingston fire districts. The participants were given a tour in order to re-familiarize them with the facility, and the facility fire protection system.

Operator Training

On 8 June 2010, Zach Richards obtained his Reactor Operator License, and Maggie Damato obtained her Senior Reactor Operator License.

Cooling System Upgrade

As part of the 2009 NEUP grant, RINSC received funding to do a cooling system upgrade. In order to stay consistent with the instrumentation that was used for the control rod drive system upgrade, the instrumentation part of this upgrade will use the same Opto 22 technology that was used for the drive system. The staff has discussed the project with the URI ME department to determine which cooling system parameters would be useful to measure, in addition to the parameters that are currently measured. The instrumentation will include a digital P&ID of the entire cooling system that shows cooling tower status, pump status, flow rates, pressure differences, and coolant temperatures at various locations in the system. All of this information will be digital, and will be able to be displayed on a smart board in the control room.

Also as part of this upgrade, the staff will be re-plumbing the secondary side of loop #1. The cooling system consists of two loops that have a heat exchanger and a cooling tower associated with each loop. At present, the piping between the heat exchanger and the cooling tower for loop #1 goes through a hole in a door in order to get out to the cooling tower and back. Several years ago the cooling tower for loop #2 was moved from the top

of the bunkers to the top of a gun pad next to the bunkers. When this was done, the plumbing for that system was re-routed through a wall on the back side of the basement. Structures were put in place to re-route the plumbing for loop #1 as well, but there wasn't any funding for finishing the project. The funding is now available as part of this grant.

Irradiation Room Door Project

The reactor has an irradiation room built into the pool wall at the low power end of the pool. To the best of the staff's knowledge, this experimental facility has never been used. Several years ago, RINSC obtained a shielding door from Brookhaven National Laboratory. The staff is in the process of mounting this door.

Gamma Probe

Infoscitex Corporation is a facility user that performs high dose gamma irradiations. The RINSC staff made a deal with the company to perform irradiation services in return for a high dose gamma probe system. The company purchased a probe and electrometer for RINSC. RINSC has received the detector system and is in the process of learning how to use it. The cost of the system was approximately

$5000.

NRSC Charter

The RINSC Technical Specifications require that the NRSC have a written charter. This charter was incorporated as part of the facility's Broad Scope 3K-063-01 License. This license was discontinued in April 2009. Consequently, a new NRSC Charter was written and approved by the Committee in July 2010.

Facility Utilization

This past fiscal year, the number of reactor operating hours roughly doubled over the previous fiscal year's operating history. This was largely due to the success of the facility outreach efforts by the staff. Mr. Zach Richards has prepared a brief memo describing the details of the recent facility utilization

On the High School level, the RINSC has hosted tours for Narragansett High School, Cumberland High School, The Wheeler School, and others. Many of these students participated in neutron activation and gamma spectroscopy labs. A number of students had expressed a new found interest in the nuclear field due to their experiences at the Nuclear Science Center. After participating in a tour, a student from Narragansett High School decided to do his senior project in neutron activation at the RINSC. Once again the RINSC staff also represented the AEC in the RI State Science Fair, awarding a prize for one junior and one senior project. Sean Breslin of the Curtis Corner Middle School was awarded the senior prize for his project, "Optimal Spacing of Magnets in a Gauss Magnet Accelerometer". The junior award went to Vincenzo Moretti of Prout

for his “Pulsed Linear Induction Motor” project.

The Nuclear Science Center has also hosted groups outside of the classroom. The Netopian Club of Providence visited in January; this included former RINSC RSO Ron Stevens, who stated he was very pleased with the appearance and operation of the facility. In April the GSO hosted a “Day at the Bay” for incoming marine affairs majors, which included a segment at the RINSC. The GSO and RINSC opened their doors again in the summer for “Saturday at the Bay”, which was open to the public. The RINSC personally hosted upwards of 130 guests on that day, one of whom returned for an internship. The staff has continued their outreach to the academic community through teacher’s workshops and conferences, mailing lists, and direct contact.

In addition to our academic visitors we have also been working with local fire departments and ARNORTH and the CST. In February, the US Army’s ARNORTH team, along with the Civil Support Team (CST) visited the Bay Campus and the Nuclear Science Center to run drills for preparedness for a terrorist attack. Although the exercises conducted were not credible situations, being able to train in an actual nuclear facility helped prepare the teams for real-life situations.

On September 7th the RINSC staff conducted its annual emergency evacuation drill, along with Jack Donahue of the US NRC. This exercise ran smoothly and without incident, receiving the full support of the NRC. The following day the facility hosted the Narragansett Fire Department, with representatives of the Union and Kingston Fire

Districts of South Kingstown. A thorough tour was conducted and a range of potential emergency scenarios were discussed and evaluated. These interactions with emergency personnel help make the RINSC safe from not only radiological dangers, but the same safety, fire, and medical emergencies that affect every research and education facility. The RINSC has also been represented at radiological emergency trainings throughout the state to help prepare the participating agencies for dealing with radiation. In the past few months, the RINSC has performed checks and calibrations on various radiation detectors for area fire departments and DECON and HAZMAT teams.

In addition to the work done with research and education, the RINSC staff has spent a great deal of time improving the outside image and perception of the facility. Clean-up projects have taken place throughout the facility, including the exterior areas. Over three days the reactor confinement room was cleared of 20 years worth of accumulated furniture and equipment. Anything that was of value was organized and saved for future use. Outdated and non-functioning equipment and furniture were surveyed and released. This clean-up process also extended to some of the laboratories throughout the facility, which are now ready for new users. All disposal of non-RINSC

property was cleared with the owner. Also, much of the radioactive waste housed in the facility has been inspected and organized. The materials that are not yet ready to be disposed of have been arranged in a way to facilitate future disposal and safe working environments.

In the next few months additional work will help organize and clear out the remainder of the confinement room and laboratories to better facilitate the RINSC and RIAEC goals.

Outside, the North and South gun pads have been cleared of brush and debris. The exterior of the lab and confinement buildings have been power washed and the walkways, garden beds, and lawn cleared of the majority of unwanted plant growth. Some final clean-up is planned for later this month. All of this work has greatly improved the image of the facility, making it much more pulchritudinous. Other upgrades include new instrumentation, irradiation facility overhaul, and computer and network upgrades.

Finally, throughout this time frame the staff has been working diligently on the relicensing of the facility. This included a week long trip to Argonne National Laboratory in Illinois by some of the staff, and a RINSC visit by some of their staff. Thus far we have answered more than half of the Requests for Additional Information sent by the NRC concerning our Safety Analysis Report and Technical Specifications, and continue to press forward with the remaining questions.

The Rhode Island Nuclear Science Center has made great advancements in recent history in terms of the facility and education, while maintaining our place as an integral part of the research community. Our ongoing and future projects will help place us as leaders in academics and science in Rhode Island, and throughout the research community.

Sincerely,

Zachary Richards

Reactor Supervisor

Mechanical Engineer

The Rhode Island Nuclear